Intel® NetStructure™ 6000 Switch

User Guide for the Gigabit and Fast Ethernet Modules

Intel® NetStructure™ 6000 Switch User Guide for the Gigabit and Fast Ethernet Modules

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1 Quick Start

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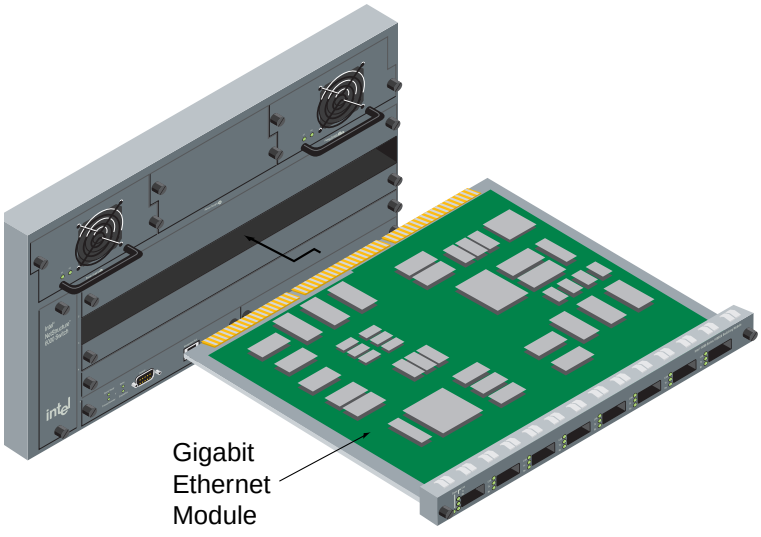
The Intel® NetStructure™ 6000 switch is a modular switch that supports up to four media modules. The table below describes the available modules.

I/O Modules	Available Modules per Chassis	Available Ports per Chassis	Features per Slot
1000Base-SX Switch Module	4	32	Eight-port full-duplex switched Gigabit Ethernet module
1000Base-LX/ 1000Base-SX Switch Module	4	32	Eight-port full-duplex switched Gigabit Ethernet module with four LX and four SX ports.
10/100Base-TX Switch Module	4	96	100Base-TX Ethernet module containing 24 switched RJ-45 ports.

I/O Modules	Available Modules per Chassis	Available Ports per Chassis	Features per Slot
Control Processor	2	N/A	Each contains one RS-232 (DB9) connector and one RJ-45 10/100 Ethernet management port.

Module Installation



To install a module

1 Remove the module from the carton.

Warning Electrostatic Sensitive Device. Do not handle the printed circuit board unless your work area is static-free!

2 Carefully remove the module from the ESD protective bag and place it on a flat surface.

3 Remove the blank filler tray from any of the empty slot bays on the switch.

4 Lift up the module by placing both hands on the side of the module faceplate panel or underneath the card.

5 Carefully slide the module into the empty slot.

6 Push the module back until it connects with the backplane and the capture panel screws engage the chassis.

7 Tighten both capture panel screws simultaneously.

2 Gigabit Ethernet Modules

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Overview of the Gigabit Ethernet Modules

The Intel® NetStructure™ 6000 switch has two Gigabit Ethernet modules. One is a 1000Base-SX card and the other is a 1000Base-LX/1000Base-SX card.

1000Base-SX Module

The chassis can house up to four 1000SX Gigabit Ethernet modules. Each Gigabit Ethernet module has eight switched ports.

Each port operates in full-duplex mode only, and can be put in auto-negotiation mode for flow control parameters.

Setting Auto-negotiation

Auto-negotiation makes it possible for devices to exchange information about their abilities over a link segment. This function allows the devices at both ends of a link segment to advertise abilities and acknowledge receipt and understanding of the common modes of operation that both devices share.

The default setting for the switch has auto-negotiation enabled on all of the ports.

1 Type **show link autoneg** *port_number* to display the auto-negotiation parameters for a link.

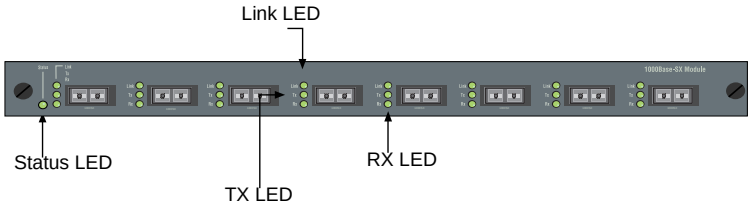
2 Type the privileged **set link** *port_number* **noautoneg** command to disable auto-negotiation on a port.

The Gigabit Ethernet module supports full-duplex mode only.

Note If auto-negotiation is not enabled for a remote partner of a 6000 switch port and another Gigabit Ethernet device, auto-negotiation must be disabled.

Only devices configured for full-duplex mode may send pause frames. Pause frames provide flow control over full-duplex links.

Gigabit Ethernet Configuration



The Gigabit Ethernet module uses SC duplex connectors as defined by the IEC 87-419 standards. The table below describes the maximum cable length for the module.

Cable Type	Length	
62.5 micron multimode	2 to 275 meters	6.56 to 902.2 feet
60 micron multimode	2 to 550 meters	6.56 to 1804.4 feet

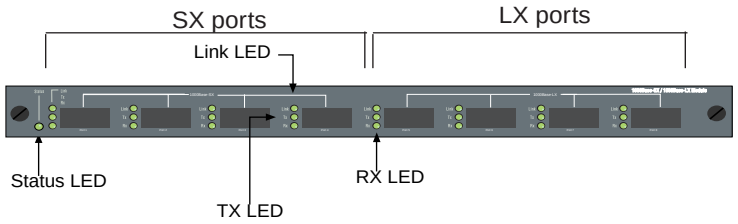
Light Emitting Diodes (LEDs) provide status information for the module. There are three LEDs per port (link, transmit and receive) and one global LED (status).

The table describes the LEDs for the module.

LED	Color	Definition
Status (Board)	Solid Yellow	Power up diagnostics are running.
	Flashing Yellow	Power up diagnostics failed.
	Flashing Green	Normal Operation - the board is operating normally.

LED	Color	Definition
Link	Solid Green	The Link LED is available on each port. The Link LED stays on while a good link is available.
RX (Receive)	Flashing Green	The Receive LED is available on each port. It flashes on and off as frames are received.
TX (Transmit)	Flashing Green	The Transmit LED flashes on and off as frame transmissions start and stop.

1000Base-LX/1000Base-SX Module



The switch supports up to four SX/LX modules for a total of 32 Gigabit Ethernet ports. In addition, each port can be enabled or disabled, and can be configured to support auto-negotiation.

Configuring ports

The default setting has all ports enabled by default. Type **show port { *port_number* | *all* }** at the command line to view the port configuration Before you can change port configuration, make sure that you are in

privileged mode. Refer to the *Intel® NetStructure™ 6000 User Guide* for instructions on entering privileged mode.

You can configure any port as enabled (active and allowing data to pass) or disabled (inactive with no data transmission or reception). All ports are enabled by default.

To disable a port, type **disable port *port_number***.

```
6000 Switch>#>disable port 8
```

The table below describes the maximum cable length for the module.

Port Type	Cable Type	Length	
1000SX	62.5 micron multimode	2 to 275 meters	6.5 to 902.2 feet
	60 micron multimode	2 to 550 meters	6.5 to 1,804.5 feet
1000LX	single-mode fiber between a 6000 switch 1000Base-LX port and a 1000Base-LX port on a non-6000 switch port.	5 kilometers	16,404.2 feet
	single-mode fiber between two 6000 switch 1000Base-LX ports.	10 kilometers	32,808.4 feet

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TX (Transmit)	Flashing Green	The Transmit LED flashes on and off as frame transmissions start and stop.

Gigabit Ethernet Troubleshooting

Power-up Problems

The following table is a quick guide to power-up problems, their possible cause, and a suggested course of action.

Symptom	Possible Cause	Course of Action
No LEDs lit on Gigabit Ethernet module.	Module needs repair.	Replace module.
Status LED yellow.	Start-of-day diagnostics failed for the Gigabit Ethernet module.	Contact Customer Support.

Symptom	Possible Cause	Course of Action
Link LED is not lit.	Dirty optics.	Try different ports and reverse the cable (if possible). Replace the cable. If replacing the cable fails to help, clean the optics.
	Bad cable or incorrect cable adapter orientation.	
	Auto-negotiation mode does not agree with remote link partner.	Change auto-negotiation mode for either link partner so that they agree.
Active Link, cannot communicate with other stations from the user console.	Management interface not IP configured.	Use **ifconfig** command, **BOOTP** or **RARP** to configure **sw1** interface.
Active Link, cannot communicate with station on a non-Gigabit Ethernet port from a station on a Gigabit Ethernet port.	Invalid VLAN configuration.	Verify the VLAN configuration.

3 Fast Ethernet Modules

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Overview of the Fast Ethernet Modules

The Intel® NetStructure™ 6000 switch has two Fast Ethernet modules. One is a 100Base-TX card which can upgrade your Ethernet network to Fast Ethernet by supporting both 10Mbps and 100Mbps on each switched port.

The other module is a 100Base-FX card which can directly upgrade your Ethernet network to 100Mbps.

10/100 Ethernet Module

This module is a 24-port 100Base-TX Ethernet card. It supports full- and half-duplex 10 and 100Mbps data transfer and auto-negotiation.

Setting Auto-negotiation

Auto-negotiation allows each end of a link to query the other to determine a compatible mode of operation. For example, if both links support full-duplex operation, then the switch can determine this mode.

When a link becomes active, the switch determines the highest throughput mode of operation between the two devices.

The Control Process (CP) software also includes commands that allow the speed and duplex of the ports to be manually set.

Note The default setting is “autoneg 100 10 full half.” The link uses autonegotiation to choose the best mode. This is usually the best setting unless the remote partner is not working properly. When the remote partner is not capable of autonegotiation, the port autosenses the speed and defaults to half duplex.

Type the privileged **set link** *port_number options* command, where *port_number* is one of the global ports on the chassis and *options* are *autoneg* or *noautoneg*, *10*, *100*, *half* or *full*.

Example

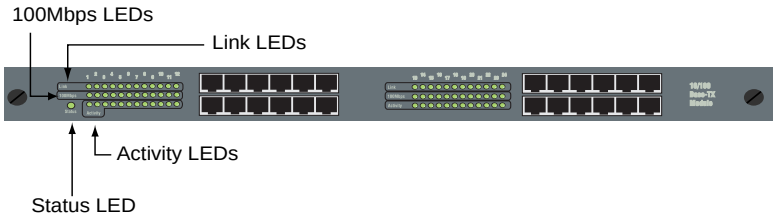
Intel Switch>#>set link 6 100 FULL no autoneg

The link configuration is stored in non-volatile memory. This allows the current setting to be restored upon the next reset.

The **set link** *port_number* **defaults** command restores the factory default link settings to the switch.

Type the non-privileged **show link** *port_number* command to display the current state of the link.

10/100 Ethernet Configuration



The module uses 24 RJ-45 modular receptacles for 100Base-TX switched Fast Ethernet transmissions over Category 5 UTP. According to IEEE 802.3, the cable length must not exceed 100 meters (328.1 feet).

Light Emitting Diodes (LEDs) provide status information for the module and individual port connections.

LED	COLOR	DEFINITION
Status	Solid Yellow	Power up diagnostics are running.
	Flashing Yellow	Power up diagnostics failed.
	Flashing Green	Normal Operation - the board is up and running.
Link	Solid Green	The Link LED is available on each port. The Link LED stays on while a good link is operable.
100Mbps	Solid Green	100Mbps channel connection is active.
Activity	Flashing Green	The port is receiving and sending traffic.

10/100 Ethernet Troubleshooting

Power-up Problems

The following table is a quick guide to power-up problems, their possible cause, and a suggested course of action.

Symptom	Possible Cause	Course of Action
No Link LED after plugging in a cable.	Bad or improper cable type.	Check cable. 100Mbps link requires Category 5 cable. Hub-to-switch or switch-to-switch connection must be made with a “crossover” cable. Check patch cables especially. Never use “silver satin” telephone patch cables. The total length of the cable should be less than 100 meters (328.1 feet) including patches.
	Ports are configured improperly.	The switch’s default link connects with any properly operating link. However, a port can be configured to link without auto-negotiation into one of several configurations. If plugged into a port that has been configured differently, the link might not connect or might not work properly. For example, a full-duplex port connected to a half-duplex port might have many frame errors.The best solution is to use the ports in auto-negotiation mode with properly functioning devices plugged into them.

Symptom	Possible Cause	Course of Action
No connectivity with a station on a switch port.	No link. Link on 10/100 module is off.	See “No Link LED” symptom above.
		Test for connectivity with the **ping** command.
	Cable has just been moved from one port to another.	Use the **clear fdb** command or wait until the aging time has expired if the destination is not generating traffic. The **set agingtime** command establishes the aging time.
	Spanning Tree has just been enabled.	Wait 60 seconds for state to change to “forwarding.”
Poor performance on a link.	A considerable amount of Data Link errors such as CRC errors.	Use the **show counters** command to display them. Or, use any SNMP-based network management tool to generate reports based on these counters.
	Too many collisions.	Too many stations on the segment. Try moving some to their own segment.
	Late Collisions.	Cables are too long. Use a shorter cable, or add a repeater or bridge.
		There are too many “hops.” Use fewer devices from end to end.